

REMARKS/ARGUMENTS

I. General Remarks and Disposition of the Claims.

At the time of the Office Action, claims 1-93 were pending. Claims 54-84 stand rejected. Claims 54 and 76 have been amended herein. In response to a restriction requirement, claims 1-53 and 85-93 have been canceled herein.

Applicants respectfully request that the above amendments be entered and further request reconsideration of the application in view of the amendments and the remarks contained herein. All the above amendments are made in a good faith effort to advance the prosecution on the merits of this case.

II. Remarks Regarding Restriction Requirement.

On December 15, 2005, during a telephone conversation with the Examiner, claims 54-84 were provisionally elected in response to the Examiner's restriction requirement without traverse. This provisional election is hereby confirmed, and claims 1-53 and 85-93 have been canceled. No amendment to inventorship is necessitated by this election. Applicants reserve their rights to subsequently take up prosecution on the claims as originally filed in this or an appropriate continuation, continuation-in-part, or divisional application.

III. Remarks Regarding Objections to Drawings.

Figures 2, 5, and 6 are objected to because they are not discernable. Figures 2, 5, and 6 have been deleted and Replacement Sheets 1/2 and 2/2 have been submitted herewith. Applicants respectfully request that these Replacement Sheets replace the previous figure sheets.

IV. Remarks Regarding Rejections Under 35 U.S.C. § 102.

A. Claims 54-61, 67-73, and 76-82 Are Not Anticipated by *Heitz*.

The Examiner has rejected claims 54-61, 67-73, and 76-82 as being anticipated by U.S. Patent Application Publication 2002/0161087 to Heitz, et al. (hereinafter "*Heitz*"). (Office Action at 8.) With respect to this rejection, the Examiner stated:

Heitz discloses a hydraulic fracturing fluid comprising an aqueous liquid, and a block copolymer containing at least one water soluble block and one hydrophobic block (see Abstract). The weight ratio of the water soluble to hydrophobic block may be 95:5 to 20:80 or 90:10 to 40:60 (see page 2, paragraph 21). In general, the

hydrophobic monomers may be chosen from styrene, butadiene and alkyl (meth)acrylates; styrene is preferred (see page 3, paragraph 53-57). The hydrophilic monomers may be chosen from monomers such as acrylic acid, methacrylic acid, acrylamide, 2-acrylamido-2-methylpropanesulphonate and quaternized 2-dimethylaminoethylmethacrylate (see page 3, paragraph 58-66). The copolymer is present at 0.1 to 10, 0.5 to 5 or 1 to 3 weight percent (see page 5, paragraph 114). Proppants may be added such as gravel or sand (see page 5, paragraph 116).

(Office Action at 8.) Applicants respectfully disagree. *Heitz* does not disclose each and every limitation recited in the subject claims as required to anticipate the claims under 35 U.S.C. § 102(b). *Manual of Patent Examining Procedure* § 2131 (2004) (hereinafter “MPEP”).

In particular, independent claims 54, 67, and 76 recite “a viscosifying agent that comprises a polymersome.” Nowhere does *Heitz* disclose this recitation. Rather than disclosing the recited polymersome, *Heitz* discloses “a hydraulic fracturing fluid comprising a block copolymer containing at least one bloc water-soluble in nature and at least one block predominantly hydrophobic in nature.” *Heitz*, ¶ 12. Dependent on a variety of factors, amphiphilic molecules, such as the block copolymers disclosed in *Heitz*, may self assemble into micelles. Generally, polymeric micelles contain essentially all polymer through the micelle and one of ordinary skill in the art could use the analogy that micelles are the “default” structure when amphiphilic molecules are dispersed in water. In contrast, polymersomes consist of a bilayer of material surrounding some liquid, and are difficult to form without requiring some type of template. However, *Heitz* contains no disclosure of the recited polymersomes. Nor has the Examiner cited any portion of *Heitz* that discloses the recited polymersomes. Accordingly, *Heitz* does not disclose each and every element of claims 54, 67, and 76.

Furthermore, the Examiner’s assertion that “the formation of at least some polymersomes is inherent” in *Heitz*, (See Office Action at 8), lacks the requisite evidentiary support. The Examiner has not cited any portion of *Heitz* as disclosing “a viscosifying agent that comprises a polymersome.” As the MPEP notes:

To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. *The mere fact that a certain thing may result from a given set of circumstances is not sufficient.*’”

MPEP § 2112.IV. (emphasis added). Accordingly, the Examiner is required to provide extrinsic evidence to support a contention that the block copolymers of *Heitz* would form polymersomes. Applicants respectfully submit that the Examiner has not provided the requisite extrinsic evidence to support the Examiner's assertion. That the Examiner must provide such evidence is reiterated in Section 2144.03.B of the MPEP, stating that "the Board cannot simply reach conclusions based on its own understanding or experience--or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings." The Examiner has not provided concrete evidence to disclose the recitation of "a viscosifying agent that comprises a polymersome."

Accordingly, Applicants respectfully submit that independent claims 54, 67, and 76, and the claims dependent therefrom, have not been shown to be anticipated by *Heitz*. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 54-61, 67-73, and 76-82.

B. Claims 54-58, 60, and 67-71 Are Not Anticipated by *Discher I*.

The Examiner has rejected claims 54-58, 60, and 67-71 as being anticipated by *Discher*, et al in 297 Science 967 of 9 August 2002 (hereinafter "*Discher I*"). With respect to this rejection, the Examiner stated:

Polymersomes from block copolymers in aqueous solution are discussed where mass fraction hydrophilic block is 35 +/- 10%, and a copolymer of polyethylene oxide-polybutadiene is mentioned (see page 970). These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating and fracturing fluids, so Applicant's intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

(Office Action at 9.) Applicants respectfully disagree. *Discher I* does not disclose each and every limitation recited in the subject claims as required to anticipate the claims under 35 U.S.C. § 102(b). MPEP § 2131.

In particular, independent claim 54, as amended, recites "a viscosified subterranean treatment fluid." Nowhere does *Discher I* disclose this recitation. Rather than disclosing a composition for subterranean applications, *Discher I* discloses that "[v]esicle development has perhaps been most prominent in the cosmetics and pharmaceutical industries." *Discher I* at 971. As described in the Specification of the present application, Applicants

respectfully submit that the use of the composition is limited to subterranean formations. Accordingly, *Discher I* does not disclose the recited “subterranean treatment fluid.” For analogous reasons, *Discher I* does not disclose a “fracturing fluid” as recited in independent claim 67. Therefore, *Discher I* does not disclose each and every recitation of Applicants’ independent claims 54 and 67.

Therefore, independent claims 54 and 67 are not anticipated by *Discher I*. The remaining rejected claims depend either directly or indirectly on independent claims 54 and 67. All these dependent claims, which include all the limitations of their corresponding independent claim, are allowable for at least the reasons cited above with respect to independent claims 54 and 67. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 54-58, 60, and 67-71.

C. Claims 54-58, 60, and 67-71 Are Not Anticipated by *Dimova*.

The Examiner has rejected claims 54-58, 60, and 67-71 as being anticipated by *Dimova*, et al in 7 Eur. Phys. J. E 241 published in 2002 (hereinafter “*Dimova*”). With respect to this rejection, the Examiner stated:

This article concerns polymersome made with a diblock copolymer of polybutadiene and polyethylene oxide (see Abstract). A PB32-PEO20 polymer is used which is about 33 weight percent hydrophilic (PEO) (see page 242). The polymersomes are formed in water/aqueous solution (see page 242). These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating and fracturing fluids, so Applicant’s intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

(Office Action at 9.) Applicants respectfully disagree, because *Dimova* does not disclose, each and every limitation recited in the subject claims as required to anticipate the claims under 35 U.S.C. § 102(b). MPEP § 2131.

In particular, independent claim 54, as amended, recites “a viscosified subterranean treatment fluid.” Nowhere does *Dimova* disclose or suggest this recitation. Rather than disclosing a composition for subterranean applications, *Dimova* discloses that the “[p]olymerized vesicles are potentially suitable for areas like oral drug delivery.” *Dimova* at 250. As described in the Specification of the present application, Applicants respectfully submit that the use of the composition is limited to subterranean formations. Accordingly, *Dimova* does not disclose the recited “subterranean treatment fluid.” For analogous reasons, *Dimova* does not

disclose a “fracturing fluid” as recited in independent claim 67. Therefore, *Dimova* does not disclose each and every recitation of Applicants’ independent claims 54 and 67.

Therefore, independent claims 54 and 67 are not anticipated by *Dimova*. The remaining rejected claims depend either directly or indirectly on independent claims 54 and 67. All these dependent claims, which include all the limitations of their corresponding independent claim, are allowable for at least the reasons cited above with respect to independent claims 54 and 67. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 54-58, 60, and 67-71

D. Claims 54-57, 60-61, 63-64, 67-70, 73, 75-79, and 84 Are Not Anticipated by Churchill.

The Examiner has rejected claims 54-57, 60-61, 63-64, 67-70, 73, 75-79, and 84 as being anticipated by U.S. Patent No. 4,745,160 to Churchill, et al. (hereinafter “*Churchill*”). With respect to this rejection, the Examiner stated:

Churchill discloses a block copolymer dispersible in water (see Abstract). The copolymer may be made of blocks of hydrophobic polymer and hydrophilic polymer (see column 4, lines 10-24). The hydrophobic polymer may be polylactide, polyglycolide or a polyorthoester (see column 4, lines 25-50). The hydrophilic polymer may be polyethylene oxide, polyacrylamide and polyvinylpyrrolidone among others (see column 5, lines 5-10). A 25:75 by weight hydrophilic:hydrophobic block copolymer is given in Example 1, where the hydrophobic block is polylactide; at least some polymersomes in aqueous solution would be inherently produced in this procedure, and the polymersome and the acid-releasing material are the same. This later mixture is a dispersion of particles. Note also the procedure outlined in column 3 as to inherent polymersome production. These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating, fracturing and gravel pack fluids, so Applicant’s intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

(Office Action at 10.) Applicants respectfully disagree, because *Churchill* does not disclose, each and every limitation recited in the subject claims as required to anticipate the claims under 35 U.S.C. § 102(b). MPEP § 2131.

In particular, independent claims 54, 67, and 76 recite “a viscosifying agent that comprises a polymersome.” Nowhere does *Churchill* disclose this recitation. Rather than disclosing the recited polymersome, *Churchill* is directed to “[a] pharmaceutically or veterinarily

acceptable amphipathic block copolymer, which is self-dispersable in water to form a stable dispersion in water.” *Churchill*, col. 9, ll. 32-35. Dependent on a variety of factors, amphiphilic molecules, such as the block copolymers disclosed in *Churchill*, may self assemble into micelles. Generally, polymeric micelles contain essentially all polymer through the micelle and one of ordinary skill in the art could use the analogy that micelles are the “default” structure when amphiphilic molecules are dispersed in water. In contrast, polymersomes consist of a bilayer of material surrounding some liquid, and are difficult to form without requiring some type of template. However, *Churchill* contains no disclosure of the recited polymersomes. Nor has the Examiner cited any portion of *Churchill* that discloses the recited polymersomes. Accordingly, *Churchill* does not disclose each and every element of claims 54, 67, and 76.

Furthermore, the Examiner’s assertion that “the formation of at least some polymersomes is inherent” in *Churchill*, (See Office Action at 10), lacks the requisite evidentiary support. The Examiner has not cited any portion of *Churchill* as disclosing “a viscosifying agent that comprises a polymersome.” As the MPEP notes:

To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. *The mere fact that a certain thing may result from a given set of circumstances is not sufficient.*’”

MPEP § 2112.IV. (emphasis added). Accordingly, the Examiner is required to provide extrinsic evidence to support a contention that the block copolymers of *Churchill* would form polymersomes. Applicants respectfully submit that the Examiner has not provided the requisite extrinsic evidence to support the Examiner’s assertion. That the Examiner must provide such evidence is reiterated in Section 2144.03.B of the MPEP, stating that “the Board cannot simply reach conclusions based on its own understanding or experience--or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings.” The Examiner has not provided concrete evidence to disclose the recitation of “a viscosifying agent that comprises a polymersome.”

Furthermore, *Churchill* is directed to a pharmaceutical or veterinary composition. *Churchill*, Abstract. The present invention is directed to compositions for subterranean

applications. In particular, independent claim 54, as amended, recites “a viscosified subterranean treatment fluid,” independent claim 67 recites a “fracturing fluid,” and independent claim 76, as amended, recites a “gravel pack fluid comprising . . . particulates suitable for forming a gravel pack.” Nowhere does *Churchill* disclose these recitations. Accordingly, *Churchill* does not disclose each and every recitation of Applicants’ claims 54, 67, and 76.

Therefore, independent claims 54, 67, and 76 are not anticipated by *Churchill*. The remaining rejected claims depend either directly or indirectly on independent claims 54, 67, and 76. All these dependent claims, which include all the limitations of their corresponding independent claim, are allowable for at least the reasons cited above with respect to independent claims 54, 67, and 76. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 54-57, 60-61, 63-64, 67-70, 73, 75-79, and 84.

D. Claims 54-62, 67-74, 76-81, and 83 Are Not Anticipated by *Discher II*.

The Examiner has rejected claims 54-62, 67-74, 76-81, and 83 as being anticipated by U.S. Patent No. 6,835,394 to Discher, et al. (hereinafter “*Discher II*”). With respect to this rejection the Examiner stated:

Discher discloses the formation of polymersomes in aqueous solution (see column 4, lines 35-52). The polymersomes may be formed from block copolymers where the hydrophilic block is 20 to 50 percent by weight (see column [sic] 5, lines 2-6). Useful blocks include polyethylene oxide, polybutadiene, polystyrene and polyisoprene (see column 5, lines 15-21). These polymersomes may be used to encapsulate other materials, and so act as particulates (see column 5, lines 45-53). Some of polymersome copolymers are given in Table 1 in column 13 and Table 2 in column 15 which include polyethylene oxide-polybutadiene. Polymersomes maybe be placed in phosphate buffered saline solution (see column 21, lines 45-57). The polymersome content of some aqueous solutions made was reported at 0.01 to 1.0 weight percent (see column 16, lines 57-67). These solutions would be at least slightly more viscous than the aqueous base solution and would be useful as drilling, treating and fracturing fluids; so Applicant’s intended use does not distinguish over the prior art. *In re Pearson*, 181 USPQ 641.

(Office Action at 10-11.) Applicants respectfully disagree, because *Discher II* does not disclose, expressly or inherently, every element recited in the subject claims as required to anticipate the claims under 35 U.S.C. § 102(b). MPEP § 2131.

In particular, independent claim 54, as amended, recites “a viscosified subterranean treatment fluid.” Nowhere does *Discher II* disclose this recitation. Rather than disclosing a composition for subterranean applications, *Discher II* is directed to:

[D]elivery or storage of drugs or other compositions , such as oxygen, to the patient via the bloodstream, gastrointestinal tract, or other tissues, as replacement artificial tissue or soft biomaterial, as optical sensors, and as a structural basis for metal or alloy coatings to provide materials having unique electric or magnetic properties for use in high-dielectric or magnetic applications or as microcathodes.

Discher II, col. 4, ll. 53-64. As described in the Specification of the present application, Applicants respectfully submit that the use of the composition is limited to subterranean formations. Accordingly, *Discher II* does not disclose the recited “subterranean treatment fluid.” For analogous reasons, *Discher II* does not disclose a “fracturing fluid” as recited in independent claim 67 or a “gravel pack fluid” as recited in independent claim 76. Therefore, *Discher II* does not disclose each and every recitation of Applicants’ independent claims 54, 67, and 76.

Furthermore, independent claim 76, as amended, recites a “gravel pack fluid comprising . . . particulates suitable for forming a gravel pack.” Nowhere does *Discher II* disclose this recitation. Accordingly, *Discher II* does not disclose the recited “particulates suitable for forming a gravel pack,” and thus does not disclose each and every element of independent claim 76.

Therefore, independent claims 54, 67, and 76 are not anticipated by *Discher II*. The remaining rejected claims depend either directly or indirectly on independent claims 54, 67, and 76. All these dependent claims, which include all the limitations of their corresponding independent claim, are allowable for at least the reasons cited above with respect to independent claims 54, 67, and 76. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 54-62, 67-74, 76-81, and 83.

V. Remarks Regarding Rejections Under 35 U.S.C. § 103.

The Examiner has rejected claims 54-81 and 83-84 under 35 U.S.C. § 103(a) as being obvious over *Discher II* in view of U.S. Patent Application Publication 2004/0010060 to Joanicot, et al. (hereinafter “*Joanicot*”), U.S. Patent No. 5,226,480 to Dovan, et al. (hereinafter “*Dovan*”), and U.S. Patent Application Publication 2003/0060374 to Cooke (hereinafter “*Cooke*”). With respect to this rejection, the Examiner stated:

Discher has been discussed above; the polymersomes there may be used to encapsulate other materials as stated there. This reference discloses all of the limitations of the rejected claims, except for pH adjusting and acid and base releasing materials of the rejected claims.

Joanicot discloses block copolymer based vesicles that are at least similar to polymersomes. These vesicles may carry "any hydrophilic active that may be introduced in a classical vesicle..." (see page 9, paragraph 207), but solid actives may be used that are not necessarily water soluble (see page 9, paragraph 208); included are those for oil field use (as in fracturing) with some more specific examples being as cross linking catalysts and as materials that degrade polysaccharides such as carboxylic acid (see page 9, paragraph 215) – this would suggest (poly)lactides, (poly)glycolides, urea, etc to one of ordinary skill in the art. Specifically cited examples include hydrochloric acid (see paragraph 9, paragraph 216).

Relating to the teachings of Joanicot are Dovan showing the use of urea as a base precursor in an oil field application (see claim 1 there), and Cooke which discusses the use of polylactides in well bores (see page 3, paragraph 22 there).

It would have thus been obvious for one of ordinary skill in the art to use the actives taught or suggested by Joanicot (in view of Dovan and Cooke) in the polymersomes of Discher, given the teachings Joanicot that they may be used in vesicles.

(Office Action at 12-13.) Applicants respectfully disagree because the Examiner has not established a *prima facie* case of obviousness, in that the cited references do not teach each and every claim limitation. *See MPEP § 2142.* As described previously in Section IV.D., *Discher II* does not disclose a "subterranean treatment fluid" as recited in independent claim 54, a "fracturing fluid" as recited in independent claim 67, or a "gravel pack fluid comprising . . . particulates suitable for forming a gravel pack" as recited in independent claim 76. Nor has the Examiner alleged that *Joanicot*, *Cooke*, and/or *Dovan* supply these missing recitations. For instance, the Examiner merely relies on *Joanicot* for the delivery of actives that may be used in oil fields. (Office Action at 12.) Accordingly, *Discher II* in view of *Joanicot*, *Cooke*, and *Dovan* does not teach each and every limitation of claims 54, 67, and 76.

Therefore, independent claims 54, 67, and 76 are not obviated by *Discher II* in view of *Joanicot*, *Cooke*, and *Dovan*. The remaining rejected claims depend either directly or indirectly on independent claims 54, 67, and 76. All these dependent claims, which include all

the limitations of their corresponding independent claim, are allowable for at least the reasons cited above with respect to independent claims 54, 67, and 76. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 54-81 and 83-84.

VI. No Waiver

All of Applicants' arguments and amendments are without prejudice or disclaimer. Additionally, Applicants have merely discussed example distinctions from the cited references. Other distinctions may exist, and Applicants reserve the right to discuss these additional distinctions in a later Response or on Appeal, if appropriate. By not responding to additional statements made by the Examiner, Applicants do not acquiesce to the Examiner's additional statements, such as, for example, any statements relating to what would be obvious to a person of ordinary skill in the art. The example distinctions discussed by Applicants are sufficient to overcome the anticipation and obviousness rejections.

SUMMARY

In light of the above remarks, Applicants respectfully request reconsideration and withdrawal of the outstanding objections and rejections. Applicants further submit that the application is now in condition for allowance, and earnestly solicit timely notice of the same. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

The Commissioner is hereby authorized to debit the Deposit Account of Halliburton Energy Services, Inc., No. 08-0300 in the amount of \$120.00 for the enclosed petition for extension of time within the first month. Applicants believe that no additional fees are due in association with the filing of this Response. However, should the Commissioner deem that any additional fees are due, including any fees for extensions of time, Applicants respectfully request that the Commissioner accept this as a Petition Therefor, and direct that any additional fees be charged to the Deposit Account of Halliburton Energy Services, Inc., No. 08-0300 for any underpayment of fees that may be due in association with this filing.

Respectfully submitted,

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